

What is claimed is:

- 1 1. A particulate-matter-delivery system comprising:
 - 2 (I) a cylindrical storage hopper having:
 - 3 (IA) a substantially-circular profile along the cylindrical axis; and
 - 4 (IB) a substantially-circular hopper opening adapted to expel particulate matter
 - 5 from the cylindrical storage hopper;
 - 6 (II) a bin having:
 - 7 (IIA) a bin outlet;
 - 8 (IIB) a trough-shaped feeder having a substantially-rectangular top opening; and
 - 9 (IIC) a transitional section having:
 - 10 (IIC1) a substantially-circular opening coupled to the substantially-circular
 - 11 hopper opening;
 - 12 (IIC2) a circular-to-rectangular conduit interposed between the substantially-
 - 13 circular bin opening and the substantially-rectangular top opening of
 - 14 the trough-shaped feeder;
 - 15 (III) an auger having an auger rotational axis, the auger being located within the bin, the
 - 16 auger being operatively coupled to the bin outlet, the auger being configured to rotate
 - 17 about the auger rotational axis; and
 - 18 (IV) an auger motor coupled to the auger, the auger motor being configured to rotate the
 - 19 auger about the auger rotational axis when the motor is activated, the rotating of the
 - 20 auger resulting in expulsion of the particulate matter through the bin outlet.

1 2. The system of claim 1, further comprising
2 (V) an agitator having an agitator rotational axis, the agitator being located within the bin;
3 and
4 (VI) an agitator motor coupled to the agitator, the agitator motor being configured to rotate
5 the agitator about the agitator rotational axis, the rotating of the agitator resulting in
6 agitation of the particulate matter in the bin.

1 3. A particulate-matter-delivery system comprising: /
2 a trough-shaped feeder with a rectangular feeder opening; and
3 a rectangular-to-circular conduit having a circular end and a rectangular end, the
4 rectangular-to-circular conduit extending from the rectangular opening of the trough-shaped
5 feeder, the circular end having a circular conduit opening, the rectangular end having a
6 rectangular opening mated to the rectangular feeder opening.

1 4. The system of claim 3, wherein the area of the rectangular feeder opening is
2 greater than the area of the circular conduit opening.

1 5. The system of claim 3, further comprising a storage hopper having a circular
2 hopper opening, the circular hopper opening being coupled to the circular conduit opening.

1 6. The system of claim 3, further comprising:
2 an auger located within the trough-shaped feeder, the auger having an auger rotational
3 axis; and
4 an auger motor coupled to the auger, the auger motor being configured to rotate the
5 auger about the auger rotational axis when the motor is activated, the rotating of the auger
6 resulting in expulsion of the particulate matter from the trough-shaped feeder.

1 7. A particulate-matter-delivery system comprising: /
2 a trough-shaped feeder with a substantially-rectangular feeder opening; and
3 a rectangular-to-elliptical conduit having an elliptical end and a rectangular end, the
4 rectangular-to-elliptical conduit extending from the substantially-rectangular opening of the
5 trough-shaped feeder, the elliptical end having a substantially-elliptical conduit opening, the
6 rectangular end having a substantially-rectangular conduit opening, the substantially-
7 rectangular conduit opening being mated to the substantially-rectangular feeder opening.

1 8. The system of claim 7, wherein the rectangular-to-elliptical conduit is a
2 rectangular-to-circular conduit, the rectangular-to-circular conduit having a circular end and
3 a rectangular end, the rectangular-to-circular conduit extending from the substantially-
4 rectangular opening of the trough-shaped feeder, the circular end having a substantially-
5 circular conduit opening, the rectangular end having a substantially-rectangular conduit
6 opening, the substantially-rectangular conduit opening being mated to the substantially-
7 rectangular feeder opening.

1 9. The system of claim 7, wherein the area of the substantially-rectangular feeder
2 opening is greater than the area of the substantially-elliptical conduit opening.

1 10. The system of claim 9, wherein the cross-sectional area of the rectangular-to-
2 elliptical conduit progressively decreases from the rectangular conduit end to the elliptical
3 conduit end.

1 11. The system of claim 7, further comprising a storage hopper having a
2 substantially-elliptical hopper opening, the substantially-elliptical hopper opening being
3 coupled to the substantially-elliptical conduit opening.

1 12. The system of claim 7, wherein the trough-shaped feeder comprises means for
2 expelling particulate matter.

1 13. The system of claim 7, wherein the trough-shaped feeder comprises an outlet
2 adapted to expel particulate matter.

1 14. The system of claim 13, further comprising:
2 an auger located within the trough-shaped feeder, the auger being operatively coupled
3 to the outlet, the auger having an auger rotational axis; and
4 an auger motor coupled to the auger, the auger motor being configured to rotate the
5 auger about the auger rotational axis when the motor is activated, the rotating of the auger
6 resulting in expulsion of the particulate matter through the outlet.

1 15. The system of claim 13, wherein the combination of the trough-shaped feeder
2 and the rectangular-to-elliptical conduit defines a bin.

1 16. The system of claim 15, further comprising:
2 an agitator located within the bin, the agitator having an agitator rotational axis; and
3 an agitator motor coupled to the agitator, the agitator motor being configured to rotate
4 the agitator about the agitator rotational axis, the rotating of the agitator resulting in agitation
5 of particulate matter in the bin.

1 17. A method for reducing bridging in particulate-matter-delivery systems, the
2 method comprising the steps of: /
3 interfacing a storage hopper with a trough-shaped feeder using a circular-to-
4 rectangular conduit; and
5 directing particulate matter from the storage hopper to the trough-shaped feeder
6 through the circular-to-rectangular conduit.

1 18. A method for reducing bridging in particulate-matter-delivery systems, the
2 method comprising the steps of: /
3 interfacing a storage hopper with a trough-shaped feeder using an elliptical-to-
4 rectangular conduit; and
5 directing particulate matter from the storage hopper to the trough-shaped feeder
6 through the elliptical-to-rectangular conduit.

1 19. The method of claim 18, wherein the interfacing step comprises the step of:
2 providing an elliptical-to-rectangular conduit having a substantially-elliptical opening
3 at the elliptical end of the conduit and a substantially-rectangular opening at the rectangular
4 end of the conduit, the area of the substantially-rectangular opening being greater than the
5 area of the substantially-elliptical opening.

1 20. The method of claim 18, wherein the interfacing step comprises the steps of:
2 coupling the storage hopper to the elliptical end of the elliptical-to-rectangular
3 conduit; and
4 coupling the trough-shaped feeder to the rectangular end of the elliptical-to-
5 rectangular conduit.

1 21. A method for reducing bridging in particulate-matter-delivery systems, the
2 method comprising the steps of:

3 coupling a cylindrical storage hopper to a elliptical end of the elliptical-to-rectangular
4 conduit, the cylindrical storage hopper having a substantially-elliptical axial profile, the
5 cylindrical storage hopper further having a substantially-elliptical hopper opening, the
6 elliptical end of the elliptical-to-rectangular conduit having a substantially-elliptical conduit
7 opening, the substantially-elliptical conduit opening being substantially similar in shape to
8 the substantially-elliptical hopper opening, the substantially-elliptical conduit opening being
9 substantially similar in size to the substantially-elliptical hopper opening; and

10 coupling a trough-shaped feeder to a rectangular end of the elliptical-to-rectangular
11 conduit, the trough-shaped feeder having a substantially-rectangular feeder opening, the
12 rectangular end of the elliptical-to-rectangular conduit having a substantially-rectangular
13 conduit opening, the substantially-rectangular conduit opening being substantially similar in
14 shape to the substantially-rectangular feeder opening, the substantially-rectangular conduit
15 opening being substantially similar in size to the substantially-rectangular feeder opening.

1 22. The method of claim 21, further comprising the step of:

2 directing particulate matter from the storage hopper to the trough-shaped feeder
3 through the elliptical-to-rectangular conduit.